

**COLORADO RIVER RECOVERY PROGRAM  
FY 2007 ANNUAL REPORT**

RECOVERY PROGRAM  
PROJECT NUMBER: C-6 ENTR

I. Project Title: Evaluation of larval razorback sucker drift and entrainment into depression floodplain wetlands of the middle Green River.

II. Principal Investigator(s):

Kevin Christopherson/Trina Hedrick  
Utah Division of Wildlife Resources  
Northeast Region  
152 East 100 North  
Vernal, Utah 84078  
Phone: (435) 781-9453 fax: (435) 789-8343  
E-mail: [kevinchristopherson@utah.gov](mailto:kevinchristopherson@utah.gov)  
[trinahedrick@utah.gov](mailto:trinahedrick@utah.gov)

Dr. Kevin Bestgen  
Department of Fish, Wildlife, and Conservation Biology  
Colorado State University  
Ft. Collins, CO 80523  
(970) 491-1848/fax: (970) 491-5091  
e-mail: [kbestgen@warnercnr.colostate.edu](mailto:kbestgen@warnercnr.colostate.edu)

III. Project Summary:

Floodplain wetlands are presumed to be important rearing habitat for the endangered razorback sucker (Wydoski and Wick 1998; Muth et al. 1998; Lentsch et al. 1996). Reproduction by razorback suckers occurs in the spring during peak flows of the hydrograph when highly productive floodplain habitats are accessible (Muth et al. 1998). This seasonal timing of razorback sucker reproduction indicates possible adaptation for utilizing floodplain habitats (Muth et al. 1998).

Based on the assumption that floodplain wetlands provide critical rearing habitat for razorback suckers, the Recovery Program initiated an extensive floodplain habitat restoration program (Levee Removal). The goal of the Levee Removal Program was to restore natural floodplain wetland habitats and functions that support recovery of endangered fish (specifically the razorback sucker) (Lentsch et al. 1996). To accomplish this goal, levees at selected wetlands were lowered to increase the frequency of the riverine-floodplain connection to pre Flaming Gorge Dam levels.

Data collected during 2004 pilot studies and in 2005 were instructive to address hypotheses about razorback sucker early life history and to guide sampling in 2006. Valdez (2003) developed a larval razorback sucker drift model to be used as a predictive tool for the number of floodplain acres and number of razorback larvae necessary to

reach recovery goals. An hypothesis generated by the model was that abundance of razorback sucker larvae declined to near zero a short distance downstream from the spawning area they originated from, based on an exponential decay survival function. However, preliminary data gathered during 2004 and 2005 showed that near-neutrally buoyant beads and larvae were transported considerable distances downstream, and were entrained in flood plain wetlands near the spawning bar as well as 54 miles or more downstream. These data support the notion that a mosaic of flood plain wetland habitats dispersed up and down the river downstream from spawning areas may be an optimal management goal.

Results of 2004 and 2005 studies also suggested that flow-through floodplain sites were best at entraining beads (and larvae) because entrainment occurred at all flow levels sufficient to inundate breaches. Non-flow through sites that filled only from one breach entrained fewer beads and larvae, and in some cases, returned beads to the river as they drained. The 2004 and 2005 data also showed that beads (and larvae) were not mixed in the lateral dimension of the stream channel until well downstream, 10 miles or more. Rather, beads and larvae remained on the side of the river where they were released. The implication is that floodplain wetlands near the spawning areas require larvae produced on the same side of the channel, or the likelihood of entrainment will be low. Optimization of larval entrainment in the floodplain will be crucial for ensuring survival of larval razorback suckers, and ultimately recovery.

The goal of this year's study was to evaluate larval sucker entrainment patterns into Thunder Ranch, Stewart Lake, and Bonanza Bridge and use the data to revise management of these middle Green River floodplains. Other goals of the study included evaluation of entrainment rates into these floodplain habitats and evaluation of breach configuration based on information gathered. The draft final report for this project is due autumn 2007.

IV. Study Schedule: Initial year - FY - 2004 Final year - FY 2007

V. Relationship to RIPRAP:

#### GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- II. Restore Habitat (Habitat development and maintenance)
- II.A. Restore flooded bottomland habitats.

#### GREEN RIVER ACTION PLAN: MAINSTEM

- II. Restore Habitat (Habitat development and maintenance)
- II.A. Restore flooded bottomland habitats.
- II.A.3. Implement levee removal strategy at high priority sites.
- II.A.3.d. Evaluation.

VI. Accomplishment of FY 2007 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

#### Task 1: Field Data Collection – Bead release and drift netting

This task was completed in 2006. No field work was scheduled for the 2007 field season.

#### Task 2: Drift Net Sample Processing

This task was completed in 2006. No drift sample processing was required in 2007.

#### Task 3: Larval Identification (CSU)

All fish collected in drift net samples have been identified to species.

#### Task 4: Report Preparation

Annual RIP Report (Nov 8, 2007) complete

Final report: Draft Final Report (autumn 2007); overdue/current due date:

### VII. Recommendations:

- Upon completion of the draft report, synthesize current knowledge on razorback sucker reproduction, entrainment into floodplain wetlands, river and floodplain hydrology, and identify areas where information is lacking
- Evaluate breach connections and entrainment rates at other floodplains to assess their utility for furthering razorback sucker recovery (and make improvements to floodplains or breaches where necessary)
- Make improvements to floodplains or breaches where necessary to improve their utility to contribute razorback sucker recovery
- Test or simulate entrainment during differing hydrologic conditions (e.g., longer duration, lower peak flow compared to shorter duration higher peak)
- Continue light trapping of razorback sucker larvae so we can match occurrence of larvae with flow peaks
- Sample wetlands with drift nets and light traps to assess relative entrainment (ongoing as separate scope of work)
- Evaluate razorback sucker survival in the floodplains in the fall and subsequent spring (ongoing as separate scope of work)

### VIII. Project Status:

On track and ongoing

### IX. FY 2007 Budget Status

A.	Funds Provided:	\$ 15,035
B.	Funds Expended:	\$ 12,835

- C. Difference: \$ 2,200
- D. Percent of the FY 2007 work completed, and projected costs to complete: 85%, \$2,200
- E. Recovery Program funds spent for publication charges: \$ 0
- X. Status of Data Submission: Data will be submitted at the completion of the study.
- XI. Signed: 

Trina Hedrick	10/31/2007
Principal Investigator	Date